Breast Health and Risk Assessment for Hereditary Breast Cancer Syndromes

Imagine Healthy Communities

Karinn Chambers, MD FACS
Assistant Professor Dept of General Surgery
Medical Director Texas Tech Physicians of El Paso Breast Care Center

Common Questions.

- What causes breast cancer?
- Could I have done something to prevent my breast cancer?
- How will this affect my daughters risk of breast cancer development?
- Will I die from this?
- Why me?

What causes breast cancer?

Could I have prevented this?

- Unfortunately not…

- Risk Factors are:
  - Obesity
  - Family history
  - Hormonal history
  - Alcohol consumption

How will this affect my daughters risk?

- Most breast cancers develop spontaneously
  - Only 10% are related to genetic predispositions
- Most breast cancers occur in the absence of a family history
- In the absence of a genetic predisposition, risk is only slightly greater than average

Will I die from this?

- Breast Cancer Survival Rates at 5 years

  – Stage 0: 100%
  – Stage I: 100%
  – Stage IIA: 93%
  – Stage IIB: 81%
  – Stage III: 72%
  – Stage IV: 24.3%

Why me?

Fact or Fiction?

- If I am diagnosed with breast cancer I will die from it
- I can’t get breast cancer if it doesn’t run in my family
- I do not need to get yearly mammograms
- Mammograms can cause breast cancer

Fact or Fiction?

- If I am diagnosed with breast cancer I will need to have a mastectomy
- If I have a mastectomy my breast cancer will not come back
- After breast cancer treatment I will be less of a woman
- My spouse will not be able to look me in the same way after treatment

Fact or Fiction?

- If I am diagnosed with breast cancer I will need chemotherapy
- I will lose my hair during chemotherapy
- I will be sick and bed ridden during chemotherapy
- I wont be able to work during chemotherapy

Breast Cancer Screening Protocols, High Risk Screening, Genetic Testing, Diagnosis and Staging.

Risk Assessment

- Take a thorough breast history
  - Current breast complaints/symptoms
    - Skin changes, nipple retraction, nipple discharge, masses
  - Past breast problems
    - Prior biopsies and resulting pathology if known
      - ADH/ALH
      - Number of biopsies
  - Family history of breast, ovarian, colon, and pancreatic Ca.
  - Hormonal History
    - Age of menarche
    - Age of 1st child
  - OCP’s/HRT

Screening Protocols Continued

- USPTF (2009):
  - Biennial screening for women age 50-74.
  - At physician discretion for women age 40-74.
  - No screening for women over the age of 75.
- ACS:
  - Shared decision making process for women ages 40-44.
  - Annual screening for Woman age 45-54
  - Biennial screening for women over the age of 55.
  - Continue screening as long as they have an estimated 10 year life expectancy.

Screening Protocols Continued

- American Society of Breast Surgeons(2015):
  - Discussion with her physician to consider screening mammography at age 40-44 .
  - Annual Screening for women ages 45-54.
  - Annual or Biennial screening for women 55 and older based on a shared decision making.
  - Biennial screening for women over the age of 75 if an estimated life expectancy is greater than 10 years.

Screening Protocols Continued

- American Society of Breast Surgeons (2019):
  - Women age >25 should undergo formal risk assessment for breast cancer.
  - Women with an average risk of breast cancer should initiate yearly screening mammography at age 40.
  - Women with a higher-than-average risk of breast cancer should undergo yearly screening mammography and be offered yearly supplemental imaging; this screening should be initiated at a risk-based age.
  - Screening mammography should cease when life expectancy is less then 10 yrs.

Gail Model of Risk Assessment

https://www.cancer.gov/bcrisktool/

- Includes personal history and hormonal history
- Includes 1st degree relatives
- Includes ethnicity
- Excludes those BRCA (+) or with history of DCIS, IDC, or LCIS

Gail Model

Last modified date: 05/16/2011

- Get Started with the Risk Tool
- About the Tool
- Breast Cancer Risk Factors
- Download Source Code

Page Options

Print Page

Quick Links

- Breast Cancer Home Page
- Breast Cancer: Prevention, Genetics, Causes
- Current Clinical Trials: Breast Cancer *In Situ*: Treatment
- Current Clinical Trials: Breast Cancer Prevention
- Current Clinical Trials: Breast Cancer Screening
- Breast Cancer Risk in American Women

Need Help?
Contact us by phone, Web, and e-mail
1-800-4-CANCER

The Breast Cancer Risk Assessment Tool is an interactive tool designed by scientists at the National Cancer Institute (NCI) and the National Surgical Adjuvant Breast and Bowel Project (NSABP) to estimate a woman's risk of developing invasive breast cancer. See About the Tool for more information.

The Breast Cancer Risk Assessment Tool may be updated periodically as new data or research becomes available.

Risk Tool

(Click a question number for a brief explanation, or read all explanations.)

1. Does the woman have a medical history of any breast cancer or of ductal carcinoma in situ (DCIS) or lobular carcinoma in situ (LCIS) or has she received previous radiation therapy to the chest for treatment of Hodgkin lymphoma? — Select
2. Does the woman have a mutation in either the *BRCA1* or *BRCA2* gene, or a diagnosis of a genetic syndrome that may be associated with elevated risk of breast cancer? — Select
3. What is the woman's age?
   This tool only calculates risk for women 35 years of age or older. — Select
4. What was the woman's age at the time of her first menstrual period? — Select
5. What was the woman's age at the time of her first live birth of a child? — Select
6. How many of the woman's first-degree relatives - mother, sisters, daughters - have had breast cancer? — Select
7. Has the woman ever had a breast biopsy? — Select
   - 7a. How many breast biopsies (positive or negative) has the woman had? — Select
   - 7b. Has the woman had at least one breast biopsy with atypical hyperplasia? — Select
8. What is the woman's race/ethnicity? — Select
   - 8a. What is the sub race/ethnicity? — Select

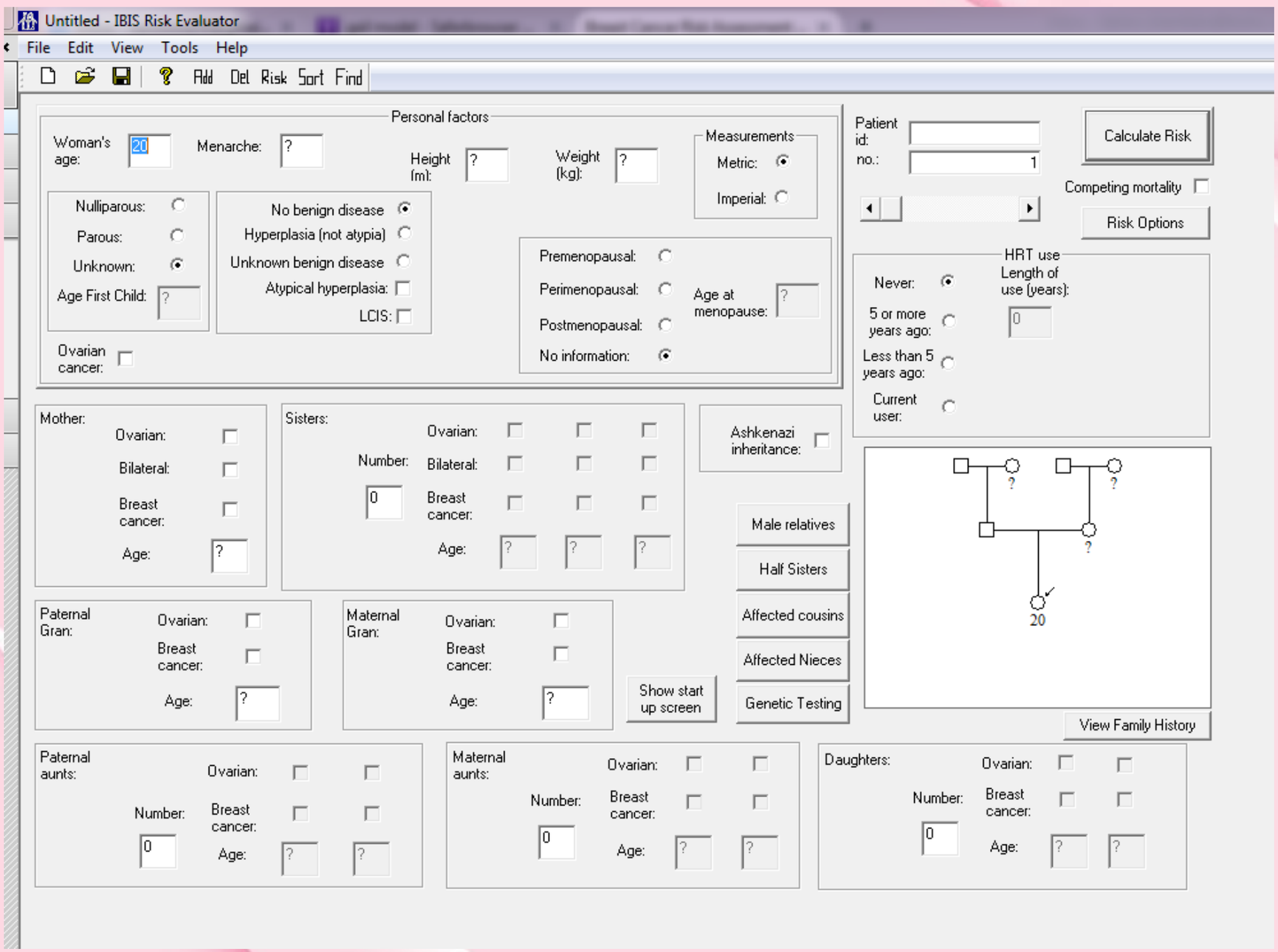
Calculate Risk >

Tyrer-Cusick Model

http://www.ems-trials.org/riskevaluator/

- Includes personal and hormonal history
  - Hgt/Wgt
- Includes 1st,2nd, and 3rd degree relatives
- Includes genetic testing

Tyrer-Cusick Model



Who is at High Risk for Breast Cancer?

- Risk assessment model reveals a greater than 20% lifetime risk for the development of breast cancer or greater than 1.7% 5 year risk

- Those individuals who underwent thoracic radiation between 10 and 30 years of age.

  – Annual Mammography
  – Annual MRI
  – Biannual clinical exam
  – Chemoprevention

High Risk Surveillance

SCREENING OR SYMPTOM CATEGORY	SCREENING/FOLLOW-UP
Increased Risk: Prior history of breast cancer	See NCCN Guidelines for Breast Cancer - Surveillance Section
Women ≥35 y with 5-year risk of invasive breast cancer ≥1.7%[d] OR	• Annual screening mammogram[h] + clinical breast exam[a] every 6–12 mo[i] ▸ to begin at diagnosis but not less than age 30 y • Breast awareness[g] • Consider risk reduction strategies (See NCCN Guidelines for Breast Cancer Risk Reduction)
Women who have a lifetime risk >20% based on history of LCIS or ADH/ALH OR	• Annual screening mammogram[h] + clinical breast exam[a] every 6–12 mo[i] ▸ to begin at diagnosis but not less than age 30 y • Breast awareness[g] • Consider risk reduction strategies (See NCCN Guidelines for Breast Cancer Risk Reduction) • Consider annual MRI ▸ to begin at diagnosis but not less than age 30 y (based on emerging evidence)
Women who have a lifetime risk >20% as defined by models that are largely dependent on family history[e]	• Annual screening mammogram[h] + clinical breast exam[a] every 6–12 mo[i] ▸ to begin 10 years prior to youngest family member but not less than age 30 y • Breast awareness[g] • Consider risk reduction strategies (See NCCN Guidelines for Breast Cancer Risk Reduction) • Recommend annual breast MRI[j] ▸ to begin 10 years prior to youngest family member but not less than age 30 y • Referral to genetic counseling if not already done
Prior thoracic RT between the ages of 10 and 30 y Current age <25 y	• Annual clinical breast exam[a] ▸ beginning 8–10 y after RT • Breast awareness[g]
Current age ≥25 y	• Annual screening mammogram[h] + clinical breast exam[a] every 6–12 mo[i] ▸ Begin 8–10 y after RT • Recommend annual breast MRI[j] • Breast awareness[g]

Genetic Testing
(Automatic testing criteria)

- Affected patient meeting the following criteria:

  – <50 years of age
  – Triple (-) breast cancer <60 years of age.
  – Known familial genetic mutation
  – Two breast cancers
  – Male patient with breast cancer
  – An individual with ovarian cancer

Genetic Testing (Cont.)

- Breast cancer at any age and…
  - One close relative with breast cancer <50
  - One close relative with ovarian cancer
  - 2 or more close relatives with breast cancer and/or pancreatic cancer
  - From a high risk population

Genetic Testing Criteria

National Comprehensive Cancer Network®

NCCN Guidelines Version 2.2016
Breast and/or Ovarian Cancer Genetic Assessment

NCCN Guidelines Index
Genetics Table of Contents
Discussion

CRITERIA FOR FURTHER GENETIC RISK EVALUATION[a]

- An individual with a breast cancer diagnosis meeting any of the following:
  - A known mutation in a cancer susceptibility gene within the family
  - Early-age-onset breast cancer[b]
  - Triple negative (ER-, PR-, HER2-) breast cancer diagnosed ≤60 y
  - Two breast cancer primaries[c] in a single individual
  - Breast cancer at any age, and
    - ≥1 close blood relative[d] with breast cancer ≤50 y, or
    - ≥1 close blood relative[d] with invasive ovarian[e] cancer at any age, or
    - ≥2 close blood relatives[d] with breast cancer and/or pancreatic cancer at any age, or
    - From a population at increased risk[f]
  - Male breast cancer
- An individual of Ashkenazi Jewish descent with breast, ovarian, or pancreatic cancer at any age
- An individual with a personal and/or family history of three or more of the following (especially if early onset[b] and can include multiple primary cancers in same individual): breast, pancreatic cancer, prostate cancer (Gleason score ≥7), melanoma, sarcoma, adrenocortical carcinoma, brain tumors, leukemia, diffuse gastric cancer[i], colon cancer, endometrial cancer, thyroid cancer, kidney cancer, dermatologic manifestations[g,h] and/or macrocephaly, hamartomatous polyps of gastrointestinal (GI) tract[h]
- An individual with an ovarian[e] cancer
- An individual with no personal history of cancer but with
  - A close relative with any of the following:[d,f]
    - A known mutation in a cancer susceptibility gene within the family
    - ≥2 breast cancer primaries in a single individual
    - ≥2 individuals with breast cancer primaries on the same side of family with at least one diagnosed ≤50 y
    - Ovarian[e] cancer
    - Male breast cancer
  - First- or second-degree relative with breast cancer ≤45 y
  - Family history of three or more of the following (especially if early onset[b] and can include multiple primary cancers in same individual): breast, pancreatic cancer, prostate cancer (Gleason score ≥7), melanoma, sarcoma, adrenocortical carcinoma, brain tumors, leukemia, diffuse gastric cancer[i], colon cancer, endometrial cancer, thyroid cancer, kidney cancer, dermatologic manifestations[g,h] and/or macrocephaly, hamartomatous polyps of GI tract[h]

→ Referral to cancer genetics professional recommended[j] → See Assessment (BR/OV-2)

[a] The criteria for further risk evaluation and genetic testing are not identical. For the purposes of these guidelines, invasive and ductal carcinoma in situ breast cancers should be included. The maternal and paternal sides of the family should be considered independently for familial patterns of cancer.

[b] Clinically use age ≤50 y because studies define early onset as either ≤40 or ≤50 y.

[c] Two breast cancer primaries includes bilateral (contralateral) disease or two or more clearly separate ipsilateral primary tumors either synchronously or asynchronously.

[d] Close blood relatives include first-, second-, and third-degree relatives. (See BR/OV-B)

[e] Includes fallopian tube and primary peritoneal cancers. *BRCA*-related ovarian cancers are associated with epithelial, non-mucinous histology. Lynch syndrome can be associated with both non-mucinous and mucinous epithelial tumors. Be attentive for clinical evidence of Lynch syndrome (See NCCN Guidelines for Genetic/Familial High-Risk Assessment: Colorectal). Specific types of non-epithelial ovarian cancers and tumors can also be associated with other rare syndromes. Examples include an association between sex-cord tumors with annular tubules and Peutz-Jeghers syndrome or Sertoli-Leydig tumors and DICER1-related disorders.

[f] For populations at increased risk due to founder mutations, requirements for inclusion may be modified.

[g] For dermatologic manifestations, see COWD-1.

[h] For hamartomatous colon polyps in conjunction with breast cancer and hyperpigmented macules of the lips and oral mucosa, *STK11* testing should be considered. See NCCN Guidelines for Genetic/Familial High-Risk Assessment: Colorectal—Peutz-Jeghers syndrome. Melanoma has been reported in some *BRCA*-related families.

[i] For lobular breast cancer with a family history of diffuse gastric cancer, *CDH1* gene testing should be considered.

[j] For further details regarding the nuances of genetic counseling and testing, see BR/OV-A.

Genetic Mutations

- High Risk
  - BRCA1/BRCA2 (Chromosome 17 and 13)
    - Breast and ovarian cancer
    - AD inheritance of variable penetrance
  - CDH-1
    - ILC and gastric cancer
  - Li-Fraumeni (TP53)
    - Breast cancer, osteosarcomas, soft-tissue sarcomas, young age of onset
  - Cowden Syndrome (PTEN)
    - Breast cancer, thyroid cancer, uterine cancer
  - PALB2
  - ATM*
  - CHEK2*
  - STK11*

BRCA 1 vs. BRCA 2

- BRCA 1
  - Greater risk of ovarian Ca
  - Greater number of TN breast cancer
  - Very responsive to therapy with cisplatin like agents
- BRCA 2
  - Greater incidence in men with breast Ca
  - Present more like sporadic breast Ca cases

What to do With the Genetic Mutations Found?

BREAST AND OVARIAN MANAGEMENT BASED ON GENETIC TEST RESULTS[a-e]

The inclusion of a gene in this table below does not imply the endorsement either for or against multi-gene testing for moderate-penetrance genes.

Gene	Breast Cancer Risk and Management	Ovarian Cancer Risk and Management	Other Cancer Risks and Management
ATM	**Increased risk of breast cancer** • Screening: Annual mammogram with consideration of tomosynthesis and consider breast MRI with contrast starting at age 40 y[f,g] • RRM: Evidence insufficient, manage based on family history	**Potential increase in ovarian cancer risk, with insufficient evidence for recommendation of RRSO**	Unknown or insufficient evidence for pancreas or prostate cancer
	Comments: Insufficient evidence to recommend against radiation therapy. Counsel for risk of autosomal recessive condition in offspring.		
BARD1	**Potential increase in breast cancer risk, with insufficient evidence for management recommendations**	**Unknown or insufficient evidence for ovarian cancer risk**	N/A
BRCA1	**Increased risk of breast cancer** • See *BRCA* Pathogenic Variant-Positive Management	**Increased risk of ovarian cancer** • See *BRCA* Pathogenic Variant-Positive Management	Prostate cancer • See *BRCA* Pathogenic Variant-Positive Management
BRCA2	**Increased risk of breast cancer** • See *BRCA* Pathogenic Variant-Positive Management	**Increased risk of ovarian cancer** • See *BRCA* Pathogenic Variant-Positive Management	Pancreas, Prostate, Melanoma • See *BRCA* Pathogenic Variant-Positive Management
BRIP1	**Unknown or insufficient evidence**	**Increased risk of ovarian cancer** • Consider RRSO at 45–50 y	N/A
	Comments: Counsel for risk of autosomal recessive condition in offspring. Based on estimates from available studies, the lifetime risk of ovarian cancer in carriers of pathogenic/likely pathogenic variants in *BRIP1* appears to be sufficient to justify consideration of risk-reducing salpingo-oophorectomy. The current evidence is insufficient to make a firm recommendation as to the optimal age for this procedure. Based on the current, limited evidence base, a discussion about surgery should be held around age 45–50 y or earlier based on a specific family history of an earlier onset ovarian cancer.		
CDH1	**Increased risk of lobular breast cancer** • Screening: Annual mammogram with consideration of tomosynthesis and consider breast MRI with contrast starting at age 30 y[f,g] • RRM: Evidence insufficient, manage based on family history	**No increased risk of ovarian cancer**	Diffuse gastric cancer • See NCCN Guidelines for Gastric Cancer: Principles of Genetic Risk Assessment for Gastric Cancer

BREAST AND OVARIAN MANAGEMENT BASED ON GENETIC TEST RESULTS[a-d]

The inclusion of a gene in this table below does not imply the endorsement either for or against multi-gene testing for moderate-penetrance genes.

Gene	Breast Cancer Risk and Management	Ovarian Cancer Risk and Management	Other Cancer Risks and Management
CHEK2	**Increased risk of breast cancer** • Screening: Annual mammogram with consideration of tomosynthesis and consider breast MRI with contrast age 40 y[f,g] • RRM: Evidence insufficient, manage based on family history	**No increased risk of ovarian cancer**	Colon • See NCCN Guidelines for Genetic/Familial High-Risk Assessment: Colorectal
	Comments: Risk data are based only on frameshift pathogenic/likely pathogenic variants. The risks for most missense variants are unclear but for some pathogenic/likely pathogenic variants, such as Ile157Thr, the risk for breast cancer appears to be lower. Management should be based on best estimates of cancer risk for the specific pathogenic/likely pathogenic variant.		
MSH2, MLH1, MSH6, PMS2, EPCAM	**Unknown or insufficient evidence for breast cancer risk[g]** • Manage based on family history	**Increased risk of ovarian cancer** • See NCCN Guidelines for Genetic/Familial High-Risk Assessment: Colorectal	**Colon, Uterine, Others** • See N… Asses…
NBN	**Increased risk of breast cancer** • Screening: Annual mammogram with consideration of tomosynthesis and consider breast MRI with contrast age 40 y[f,g] • RRM: Evidence insufficient, manage based on family history	**Unknown or insufficient evidence for ovarian cancer risk**	Unknown or insufficient evidence
	Comments: Management recommendations are based on data derived from the 657del5 Slavic truncating pathogenic/likely pathogenic variant. Although risks for other pathogenic/likely pathogenic variants have not been established it is prudent to manage patients with other truncating pathogenic/likely pathogenic variants similarly to those with 657del5. Counsel for risk of autosomal recessive condition in children.		
NF1	**Increased risk of breast cancer** • Screening: Annual mammogram with consideration of tomosynthesis starting at age 30 y and consider breast MRI with contrast from ages 30–50 y[f,g] • RRM: Evidence insufficient, manage based on family history	**No increased risk of ovarian cancer**	• Malignant peripheral nerve sheath tumors, GIST, others • Recommend referral to *NF1* specialist for evaluation and management
	Comments: At this time, there are no data to suggest an increased breast cancer risk after age 50 y. Screening recommendations only apply to individuals with a clinical diagnosis of NF. Consider possibility of false-positive MRI results due to presence of breast neurofibromas.		

BREAST AND OVARIAN MANAGEMENT BASED ON GENETIC TEST RESULTS[a-d]

The inclusion of a gene on this table below does not imply the endorsement either for or against multi-gene testing for moderate-penetrance genes.

Gene	Breast Cancer Risk and Management	Ovarian Cancer Risk and Management	Other Cancer Risks and Management
PALB2	**Increased risk of breast cancer** • Screening: Annual mammogram with consideration of tomosynthesis and breast MRI with contrast at 30 y[f,g] • RRM: Evidence insufficient, manage based on family history	**Unknown or insufficient evidence for ovarian cancer risk**	Unknown or insufficient evidence
	Comments: Counsel for risk of autosomal recessive condition in offspring.		
PTEN	**Increased risk of breast cancer** • See Cowden Syndrome Management	**No increased risk of ovarian cancer**	See Cowden Syndrome Management
RAD51C	**Unknown or insufficient evidence for breast cancer risk**	**Increased risk of ovarian cancer** • Consider RRSO at 45–50 y	N/A
	Comments: Counsel for risk of autosomal recessive condition in offspring. Based on estimates from available studies, the lifetime risk of ovarian cancer in carriers of pathogenic/likely pathogenic variants in *RAD51C* appears to be sufficient to justify consideration of RRSO. The current evidence is insufficient to make a firm recommendation as to the optimal age for this procedure. Based on the current, limited evidence base, a discussion about surgery should be held around age 45–50 y or earlier based on a specific family history of an earlier onset ovarian cancer.		
RAD51D	**Unknown or insufficient evidence for breast cancer risk**	**Increased risk of ovarian cancer** • Consider RRSO at 45–50 y	N/A
	Comments: Based on estimates from available studies, the lifetime risk of ovarian cancer in carriers of pathogenic/likely pathogenic variants in *RAD51D* appears to be sufficient to justify consideration of RRSO. The current evidence is insufficient to make a firm recommendation as to the optimal age for this procedure. Based on the current, limited evidence base, a discussion about surgery should be held around age 45–50 y or earlier based on a specific family history of an earlier onset ovarian cancer.		
STK11	**Increased risk of breast cancer** • Screening: See NCCN Guidelines for Genetic/Familial High-Risk Assessment: Colorectal • RRM: Evidence insufficient, manage based on family history	**Increased risk of non-epithelial ovarian cancer** • See NCCN Guidelines for Genetic/Familial High-Risk Assessment: Colorectal	See NCCN Guidelines for Genetic/Familial High-Risk Assessment: Colorectal
TP53	**Increased risk of breast cancer** • See Li-Fraumeni Syndrome Management	**No increased risk of ovarian cancer**	See Li-Fraumeni Syndrome Management

Diagnosis

- Self-Exam
- Clinical Exam
- Radiologic Evaluation
- Mammogram
  - Screening
  - Diagnostic
- Ultrasound
- MRI

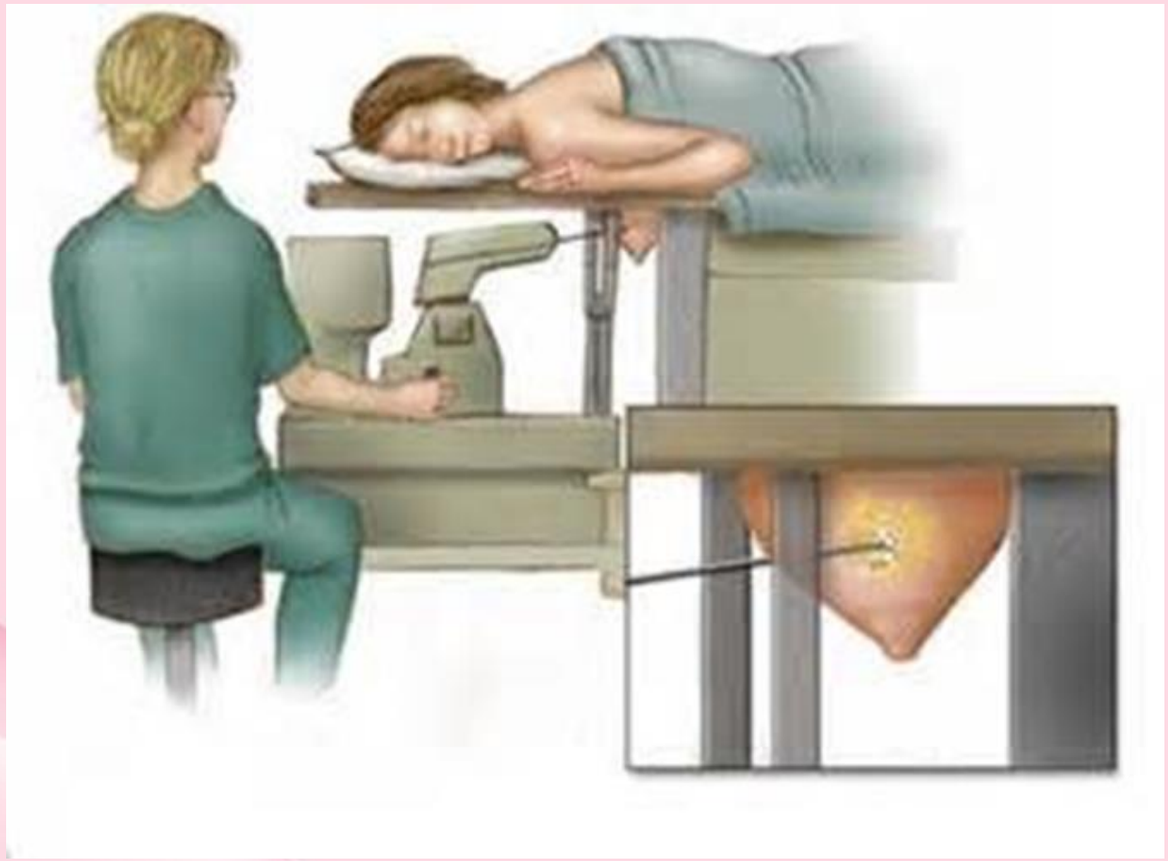
Breast Biopsy

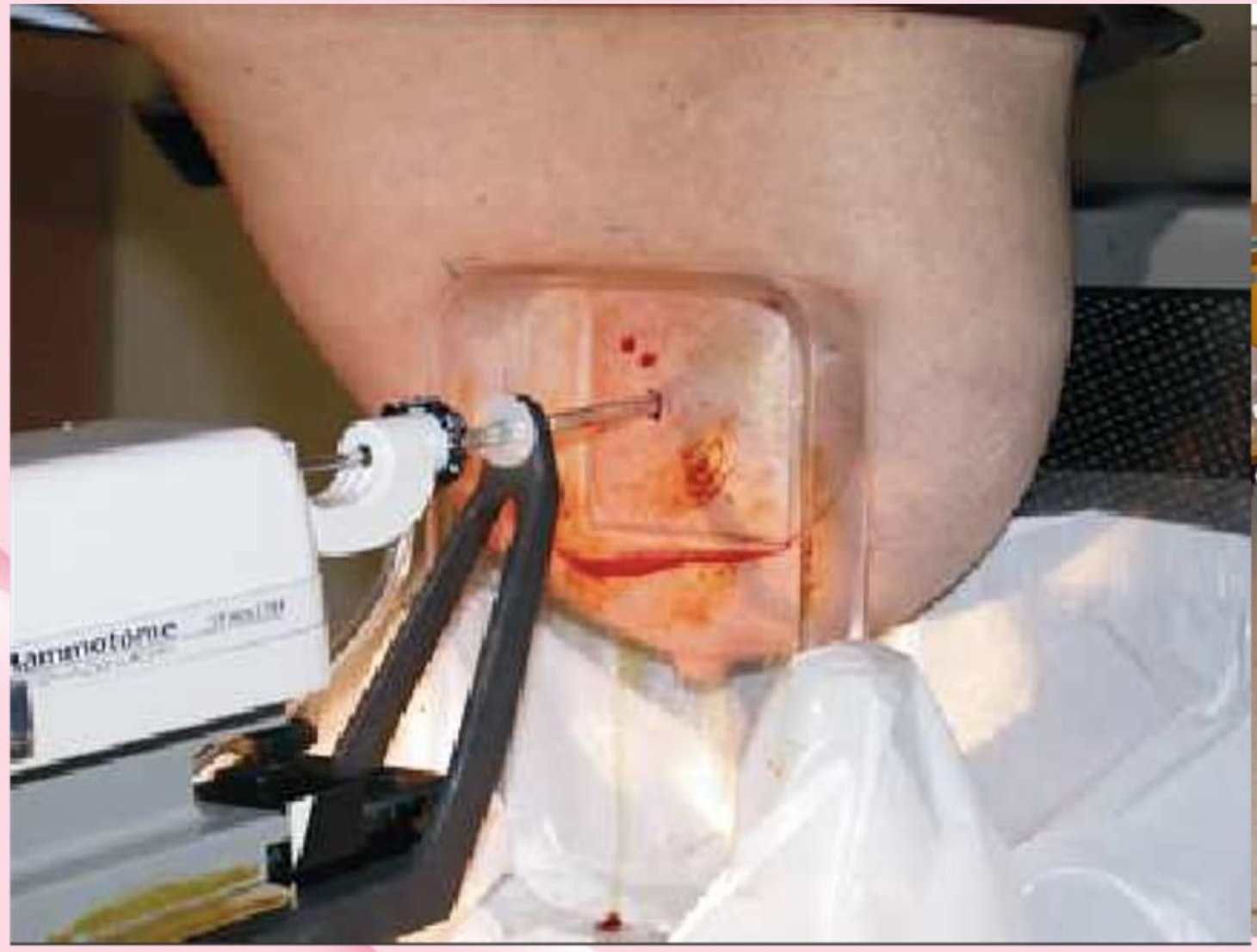
- Self-Exam
- Clinical Exam
- Radiologic Evaluation
- Mammogram
  - Screening
  - Diagnostic
- Ultrasound
- MRI

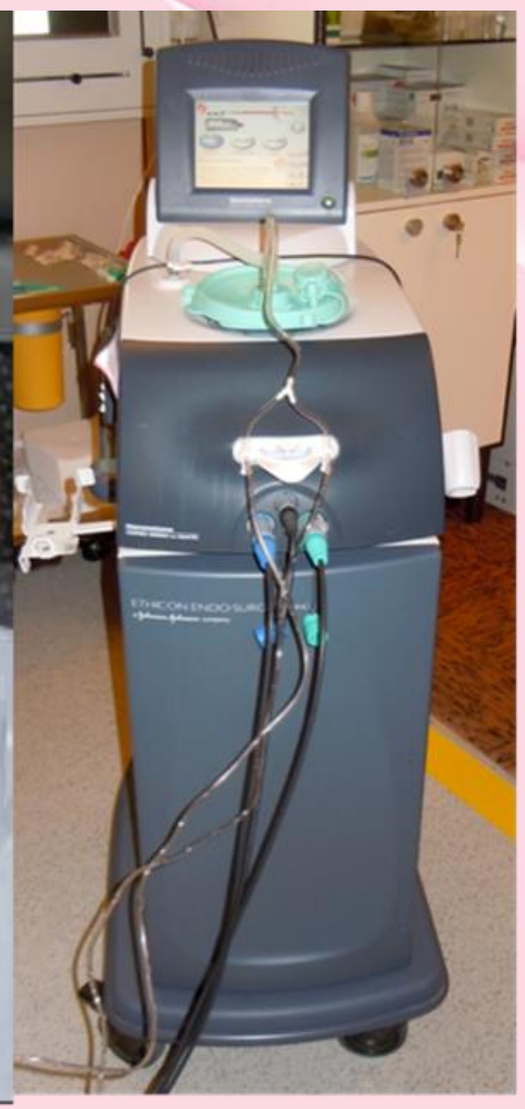
Why Image Guided Biopsy?

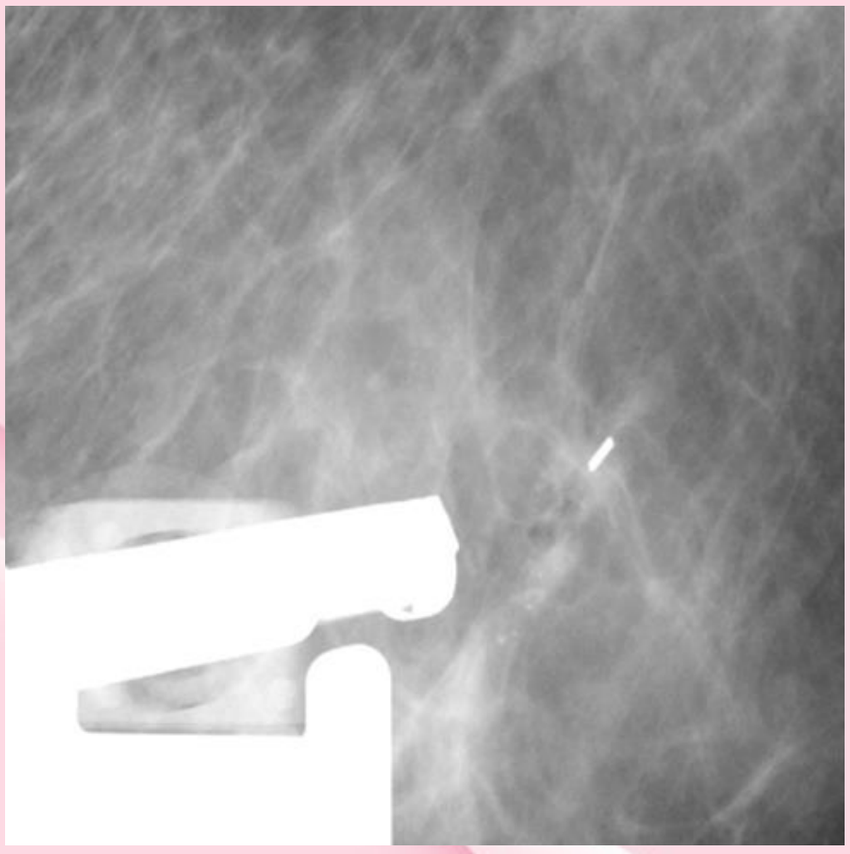
- Why would we offer this?
  - Establish Dx prior to intervention
    - Differentiate between benign/malignant lesions

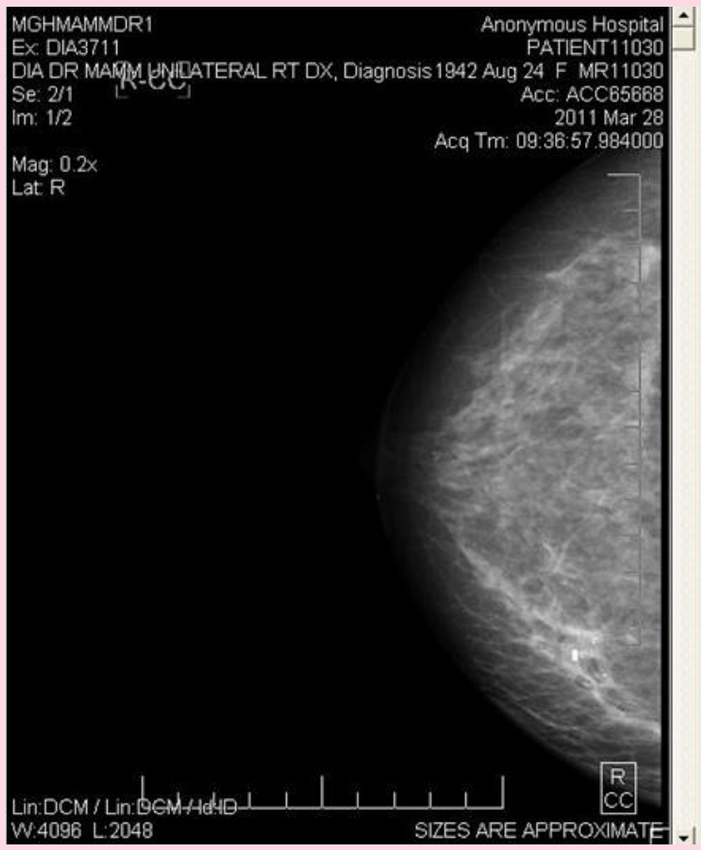
  - Once Dx established, allows for treatment planning
    - Neoadjuvant vs adjuvant chemotherapy
    - Asses necessity of other imaging modalities prior to OR
    - Allow for appropriate pre-op consultations
      - PRS
      - Genetics
      - Fertility preservation
    - Pre-operative axillary assessment/staging
    - Minimize number of interventions

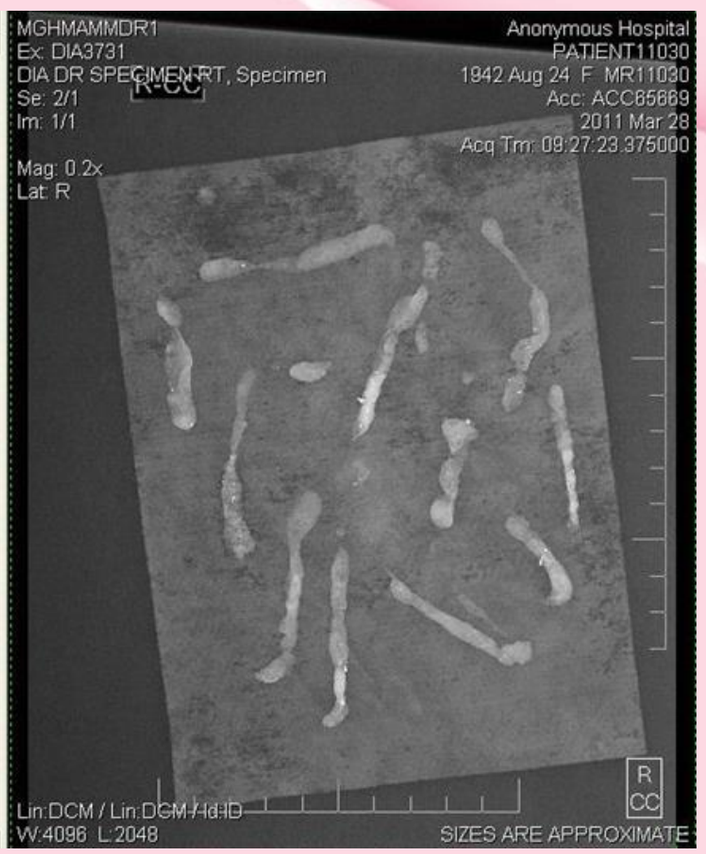


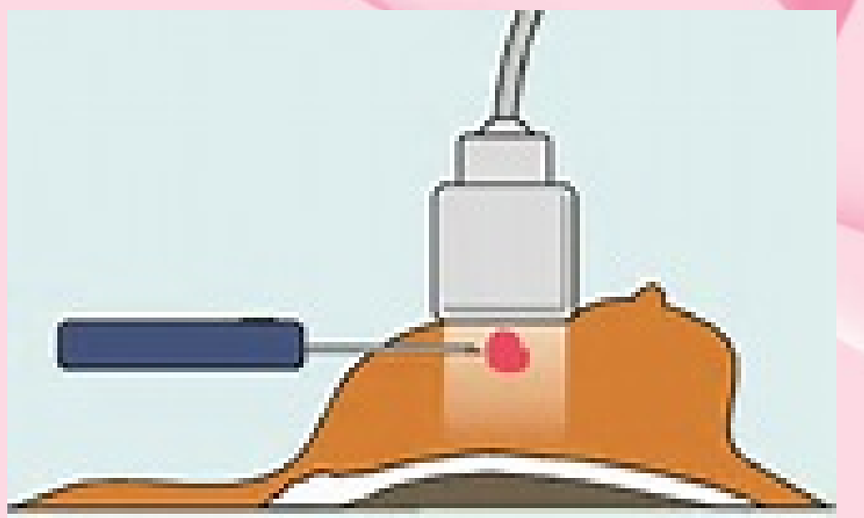


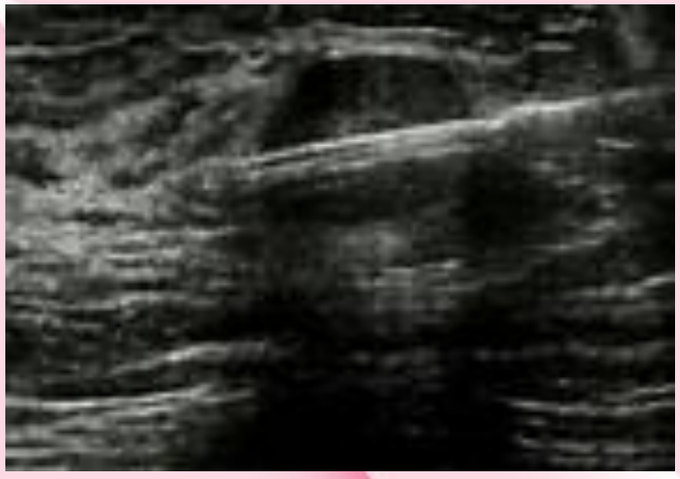


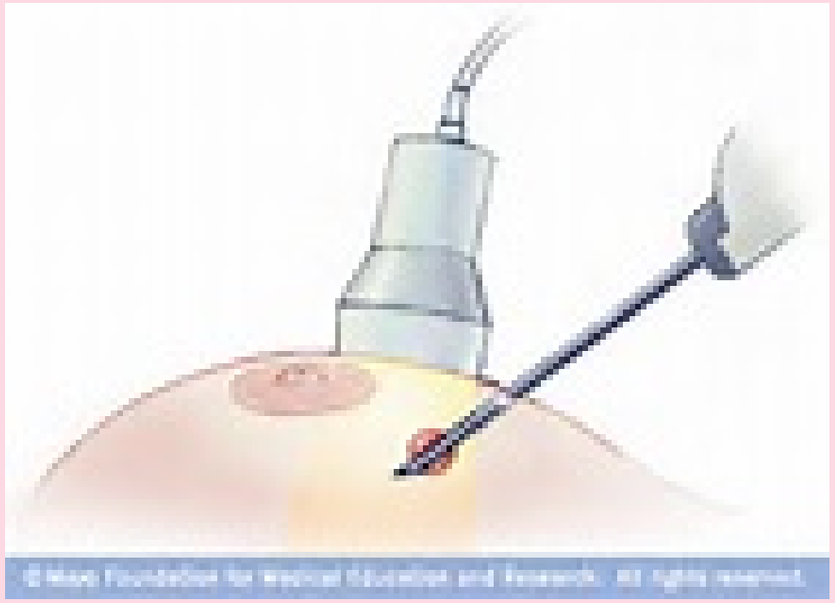



MGHMAMMDR1
Ex: DIA3711
DIA DR MAMM UNILATERAL RT DX, Diagnosis
Se: 2/1
Im: 1/2
Mag: 0.2x
Lat: R
Anonymous Hospital
PATIENT11030
1942 Aug 24 F MR11030
Acc: ACC65668
2011 Mar 28
Acq Tm: 09:36:57.984000
Lin:DCM / Lin:DCM / Id:ID
W:4096 L:2048
SIZES ARE APPROXIMATE


MGHMAMMDR1
Ex: DIA3731
DIA DR SPECIMEN RT, Specimen
Se: 2/1
Im: 1/1
Mag: 0.2x
Lat: R
Anonymous Hospital
PATIENT11030
1942 Aug 24 F MR11030
Acc: ACC65669
2011 Mar 28
Acq Tm: 09:27:23.375000
Lin:DCM / Lin:DCM / Id:ID
W:4096 L:2048
SIZES ARE APPROXIMATE







Breast Biopsy Cont.

- Surgical Biopsy
  - Needle localized excisional biopsy
    - Uses image guidance to localize the lesion then patient is taken to the operating room for excision.
    - Used for benign high risk lesions and/or discordant pathological findings
  - Open excisional biopsy
    - Patient taken to the OR then lesion removed via palpation
    - Only utilized for lesions not amenable to image guided biopsy or those strongly felt to be benign

Staging

- T
  - Tumor size
- N
  - Lymph node involvement
- M
  - Metastasis

- Addressed via AJCC guidelines

Tumor Size

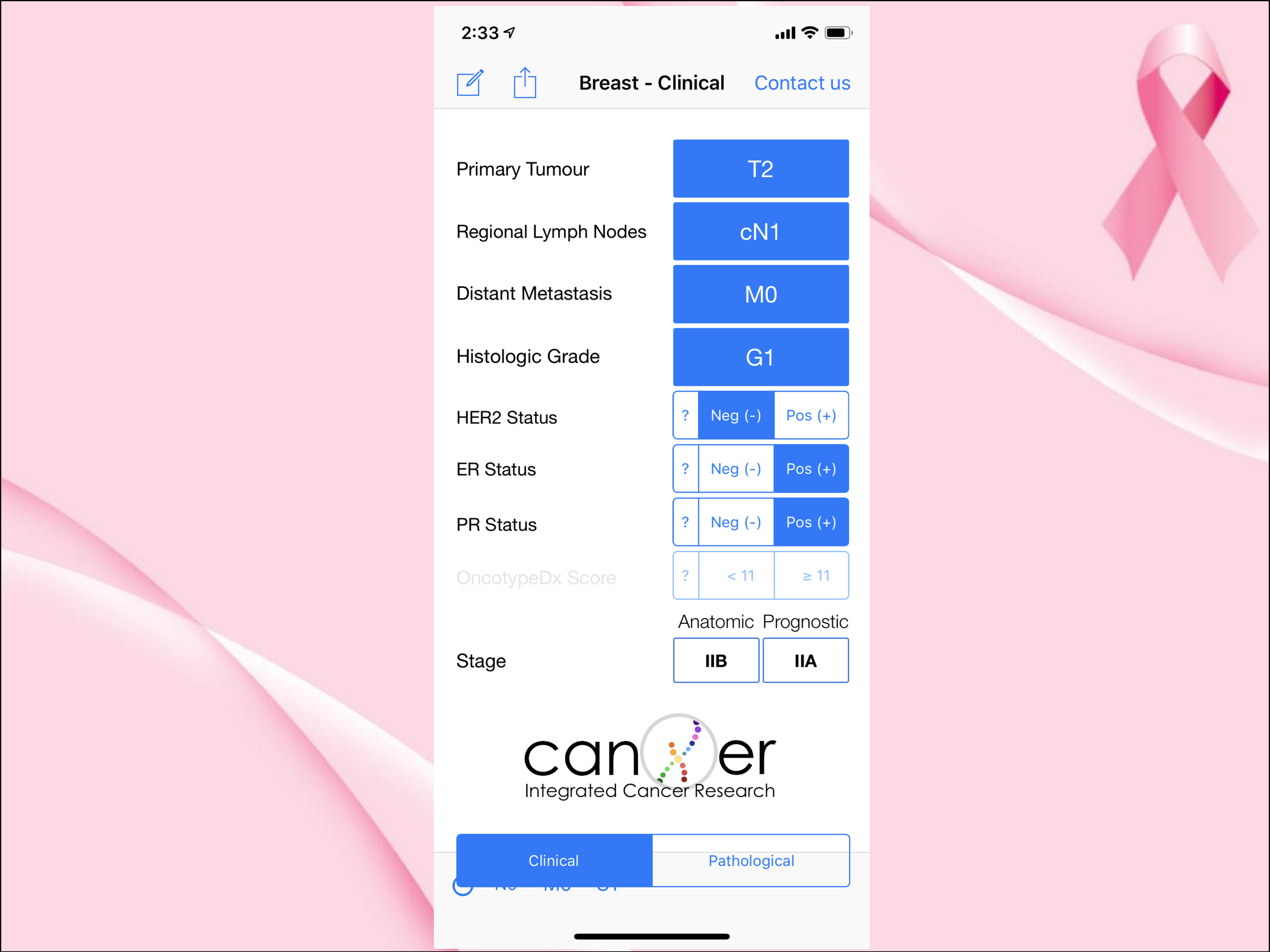
TX	Primary tumor cannot be assessed.
T0	No evidence of primary tumor.
Tis	Carcinoma *in situ*.
Tis (DCIS)	DCIS.
Tis (LCIS)	LCIS.
Tis (Paget)	Paget disease of the nipple NOT associated with invasive carcinoma and/or carcinoma *in situ* (DCIS and/or LCIS) in the underlying breast parenchyma. Carcinomas in the breast parenchyma associated with Paget disease are categorized based on the size and characteristics of the parenchymal disease, although the presence of Paget disease should still be noted.
T1	Tumor ≤20 mm in greatest dimension.
T1mi	Tumor ≤1 mm in greatest dimension.
T1a	Tumor >1 mm but ≤5 mm in greatest dimension.
T1b	Tumor >5 mm but ≤10 mm in greatest dimension.
T1c	Tumor >10 mm but ≤20 mm in greatest dimension.
T2	Tumor >20 mm but ≤50 mm in greatest dimension.
T3	Tumor >50 mm in greatest dimension.
T4	Tumor of any size with direct extension to the chest wall and/or to the skin (ulceration or skin nodules).[c]
T4a	Extension to the chest wall, not including only pectoralis muscle adherence/invasion.
T4b	Ulceration and/or ipsilateral satellite nodules and/or edema (including peau d'orange) of the skin, which do not meet the criteria for inflammatory carcinoma.
T4c	Both T4a and T4b.
T4d	Inflammatory carcinoma.

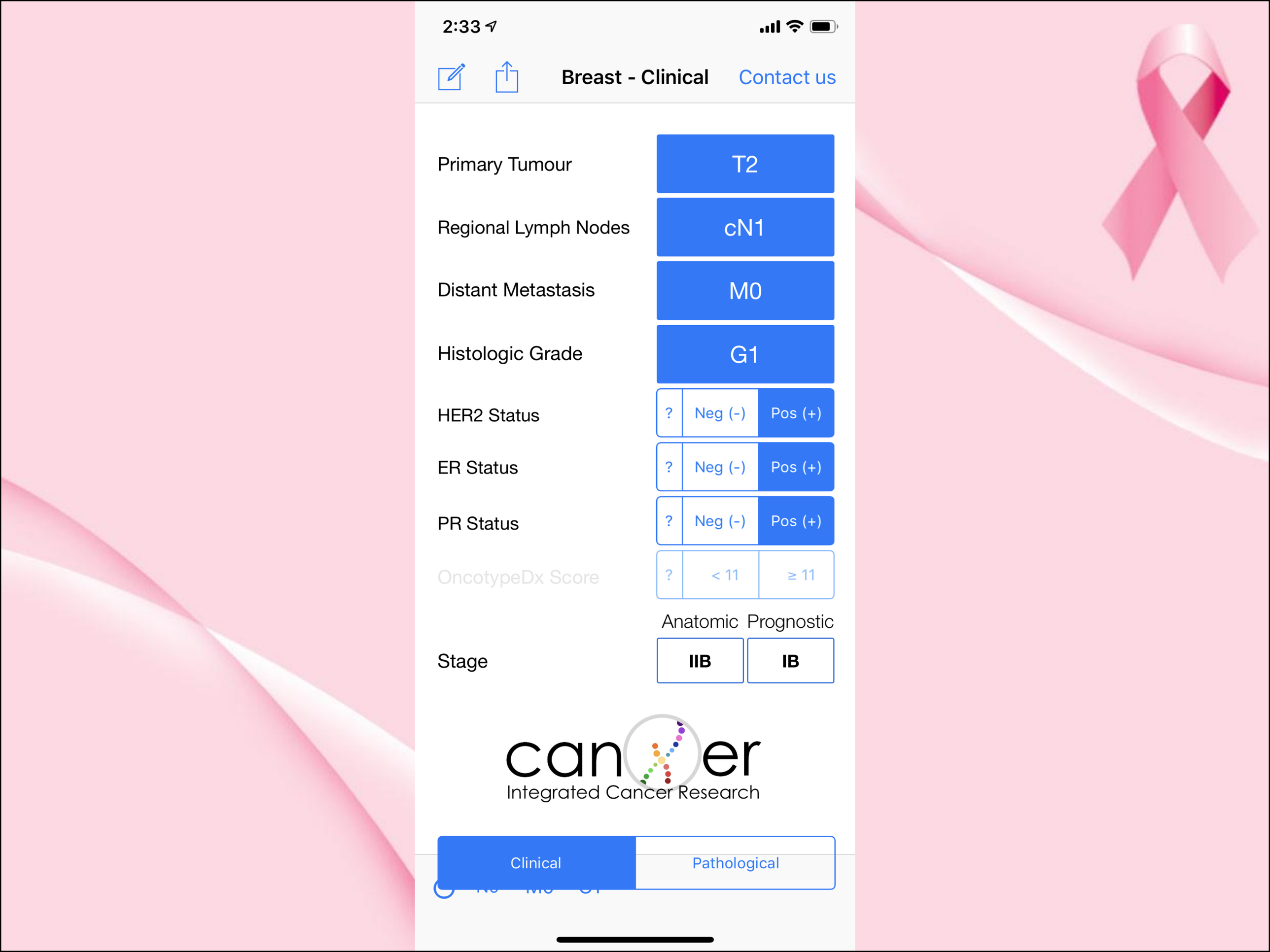
Clinical Nodal Assessment

NX	Regional lymph nodes cannot be assessed (e.g., previously removed).
N0	No regional lymph node metastases.
N1	Metastases to movable ipsilateral level I, II axillary lymph node(s).
N2	Metastases in ipsilateral level I, II axillary lymph nodes that are clinically fixed or matted. OR Metastases in clinically detected[b] ipsilateral internal mammary nodes in the *absence* of clinically evident axillary lymph node metastases.
N2a	Metastases in ipsilateral level I, II axillary lymph nodes fixed to one another (matted) or to other structures.
N2b	Metastases only in clinically detected[b] ipsilateral internal mammary nodes and in the *absence* of clinically evident level I, II axillary lymph node metastases.
N3	Metastases in ipsilateral infraclavicular (level III axillary) lymph node(s) with or without level I, II axillary lymph node involvement. OR Metastases in clinically detected[b] ipsilateral internal mammary lymph node(s) with clinically evident level I, II axillary lymph node metastases. OR Metastases in ipsilateral supraclavicular lymph node(s) with or without axillary or internal mammary lymph node involvement.
N3a	Metastases in ipsilateral infraclavicular lymph node(s).
N3b	Metastases in ipsilateral internal mammary lymph node(s) and axillary lymph node(s).
N3c	Metastases in ipsilateral supraclavicular lymph node(s).

Clinical Stage

Stage	T	N	M
0	Tis	N0	M0
IA	T1[b]	N0	M0
IB	T0	N1mi	M0
	T1[b]	N1mi	M0
IIA	T0	N1[c]	M0
	T1[b]	N1[c]	M0
	T2	N0	M0
IIB	T2	N1	M0
	T3	N0	M0
IIIA	T0	N2	M0
	T1[b]	N2	M0
	T2	N2	M0
	T3	N1	M0
	T3	N2	M0
IIIB	T4	N0	M0
	T4	N1	M0
	T4	N2	M0
IIIC	Any T	N3	M0
IV	Any T	Any N	M1


2:33
Breast - Clinical
Contact us
Primary Tumour
T2
Regional Lymph Nodes
cN1
Distant Metastasis
M0
Histologic Grade
G1
HER2 Status
?
Neg (-)
Pos (+)
ER Status
?
Neg (-)
Pos (+)
PR Status
?
Neg (-)
Pos (+)
OncotypeDx Score
?
< 11
≥ 11
Anatomic
Prognostic
Stage
IIB
IIA
cancer
Integrated Cancer Research
Clinical
Pathological


2:33
Breast - Clinical
Contact us
Primary Tumour
T2
Regional Lymph Nodes
cN1
Distant Metastasis
M0
Histologic Grade
G1
HER2 Status
? Neg (-) Pos (+)
ER Status
? Neg (-) Pos (+)
PR Status
? Neg (-) Pos (+)
OncotypeDx Score
? < 11 ≥ 11
Anatomic Prognostic
Stage
IIB
IB
cancer
Integrated Cancer Research
Clinical
Pathological

Issues You Would Like Discussed?

Thank you, and hope to see you next time.